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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/849,038	05/20/2004	Takeki Okamoto	843.43861X00	7034

24956 7590 12/16/2005

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ALEXANDRIA, VA 22314

EXAMINER
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VITAL, PIERRE M

ART UNIT	PAPER NUMBER
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2188

DATE MAILED: 12/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/849,038

Applicant(s)

OKAMOTO ET AL.

Examiner

Pierre M. Vital

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-7,11,12 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 3,4,8-10,13,14 and 18-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/20/04, 8/26/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. This Office Action is in response to Application No. 10/849,038 filed May 20, 2004. Claims 1-20 are pending in this application.

The specification and the claims have been examined with the results that follow.

### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

3. The information disclosure statement (IDS) filed May 20, 2004 and August 26, 2005 complies with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609. Accordingly, the information disclosure statement has been considered by the examiner.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claims 1 and 11 recite the limitation "when there is caused an error in writing or reading data into or from a storage area, writing or reading data is repeated again after

notifying that writing or reading data has been normally completed” in lines 3-7 and 4-8 of the claims respectively.

The limitation is incomplete for omitting essential elements, such omission amounting to a gap between the elements. It is not clear how the error is being resolved to resume normal reading or writing.

(b) Claims 1 and 11 recite the limitation “for which a number or repeated times is large” in lines 37-38 and 38-39 of the claims respectively. It is not clear what the “number of repeated times” is referring to in the claims. Examiner will interpret the “number of repeated times” as meaning “the number of repeated times for reading or writing”.

(c) Claims 1 and 11 recite the limitation “said channel control sections” in lines 20, 23 and 25 and lines 19, 22 and 24 respectively. There is insufficient antecedent basis for this limitation in the claims. Even though the claims recite the use of “channel sections”, there is no previous mention of “channel control sections” in the claims.

(d) Claim 2 recites the limitation “said storage device in said cache memory”. There is insufficient antecedent basis for this limitation in the claims. There is no previous mention of “a storage device in a cache memory” in the claims.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-2, 5-7, 11-12 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honda et al (US 2004/0250021) and Atsushi (JP 2003-141824).

As per claim 1, Honda discloses a disk array apparatus comprising:

storage device control sections which includes storing areas saving requests for write or read operations of data into or from said plurality of storage devices, controls the write or read operation of data into or from said plurality of storage devices, and receives notification that the write or read operation of data into or from said plurality of storage devices is normally completed (Fig. 1; elements 30, 31 and 32; Paragraph 47);

channel sections which receives a request for write or read operation from a network outside the disk array apparatus itself (Fig. 1; Ports 23 and 33 connected to network 5; Paragraphs 49-50);

a shared memory in which pieces of control information communicated by said channel control sections and said storage device control sections are stored (Fig. 1; memory 51 connected to ports 23 and elements 30-32);

a cache memory in which pieces of data for communication between said channel control sections and said storage device control section are temporarily saved (Fig. 19; cache 71); and

a connecting section connected to said channel control sections, said storage device control sections, said shared memory, and said cache memory (Fig. 19, backplane 9), wherein:

said storage device control sections generate logical storage areas using said storage areas in said plurality of storage devices, said logical storage areas being used for writing or reading data and having redundancy to store data (Paragraphs 53, 169 and 174);

said storage device control sections monitor said storing areas in which a request for writing or reading data into or from the plurality of storage devices forming the logical storage areas is stored (Paragraph 53).

Regarding claim 1, Honda does not teach a plurality of storage devices by which writing or reading data is executed in such a way that, when there is caused an error in writing or reading data into or from a storage area, writing or reading data is repeated again after notifying that writing or reading data has been normally completed; said plurality of storage devices forming said logical storage areas, said storage device control sections specify a storage device, for which a number of repeated times is large, and block said specified storage device.

Atsushi discloses a disk device for executing read/write wherein when a read error occurs, first of all, the error factor of the generated read error is acquired (S3) and a specified number of times of retry corresponding to the acquired error factor is acquired from a retry table (S4). Then, retry is repeated on the basis of the acquired specified number of times of retry (N in S5) and when retry is repeated to the specified number of times of retry (Y in S5), an error code is transmitted to the host device (S6). Then, the error is reported and read processing is ended. Thus, in the disk device, retry is executed required times suitable for the error factor and useless retry is not executed, so that the retry time can be shortened (see Abstract).

Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by applicant, to modify the system of Honda to include a disk error control function as taught by Atsushi, due to the similar nature of the problem to be solved, i.e., error recovery, so that the retry time can be shortened thereby useless retry is not executed as taught by Atsushi.

Claim 2 is rejected using the same rationale as for the rejection of claim 1 above. Noting that Honda discloses information representing a virtual and real volumes state includes size (Paragraph 64).

Claim 5 is rejected using the same rationale as for the rejection of claim 1 above.

Claim 6 is rejected using the same rationale as for the rejection of claim 1 above.

Claim 7 is rejected using the same rationale as for the rejection of claim 1 above.

Claim 11 is rejected using the same rationale as for the rejection of claim 1 above.

Claim 12 is rejected using the same rationale as for the rejection of claim 2 above.

Claims 15-17 are rejected using the same rationale as for the rejection of claims 5-7 above.

***Allowable Subject Matter***

8. Claims 3-4, 8-10, 13-14 and 18-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

As per claims 3 and 13, the prior art of record does not teach or suggest "a shared memory has areas which hold average response times for each of the plurality of storage devices; and said storage device control sections compare said average response times among said plurality of storage devices with the redundancy when the storage device with a larger number of repeated times for writing or reading data is specified, and specify the storage device with larger average response time as one to



be blocked” in combination with the other elements set forth in the claimed invention.

As per claims 4 and 14, the prior art of record does not teach or suggest “a storage device control sections have areas which hold queue numbers for each of the plurality of storage devices, compare said queue numbers among said plurality of storage devices with the redundancy when the storage device with a larger number of repeated times for writing or reading data is specified, and specify the storage device with larger average response time as one to be blocked” in combination with the other elements set forth in the claimed invention.

As per claims 8 and 18, the prior art of record does not teach or suggest “one of the conditions is a differential multiple of an amount of a piece of write pending data in the cache memory to be written into said storage devices” in combination with the other elements set forth in the claimed invention.

As per claims 9 and 19, the prior art of record does not teach or suggest “one of the conditions is a differential multiple of an average response time for each of said plurality of storage devices” in combination with the other elements set forth in the claimed invention.

As per claims 10 and 20, the prior art of record does not teach or suggest “one of the conditions is a differential multiple of a queue number for each of said plurality of

storage devices” in combination with the other elements set forth in the claimed invention.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is required under 37 C.F.R. § 1.111(c) to consider these references fully when responding to this action. The documents cited therein teach blocking storage device in a disk array apparatus fro which a number of repeated times for reading and writing is large.

11. The examiner requests, in response to this Office action, support be shown for language added to any original claims on amendment and any new claims. That is, indicate support for newly added claim language by specifically pointing to page(s) and line no(s) in the specification and/or drawing figure(s). This will assist the examiner in prosecuting the application.


12. When responding to this office action, Applicant is advised to clearly point out the patentable novelty which he or she thinks the claims present, in view of the state of the art disclosed by the references cited or the objections made. He or she must also show how the amendments avoid such references or objections See 37 CFR 1.111(c).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pierre M. Vital whose telephone number is (571) 272-4215. The examiner can normally be reached on 8:30 am - 6:00 pm, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (571) 272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

December 9, 2005

  
**PIERRE VITAL**  
**PRIMARY EXAMINER**